Marine Life Protection Act Initiative

Draft Habitat Evaluations of the Round 1 Proposed External MPA Arrays for the MLPA North Coast Study Region

Presentation to the MLPA Master Plan Science Advisory Team
March 16, 2010 • Eureka, CA

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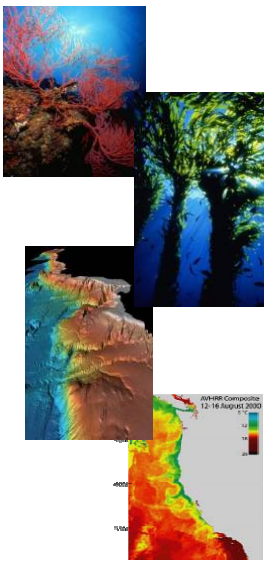
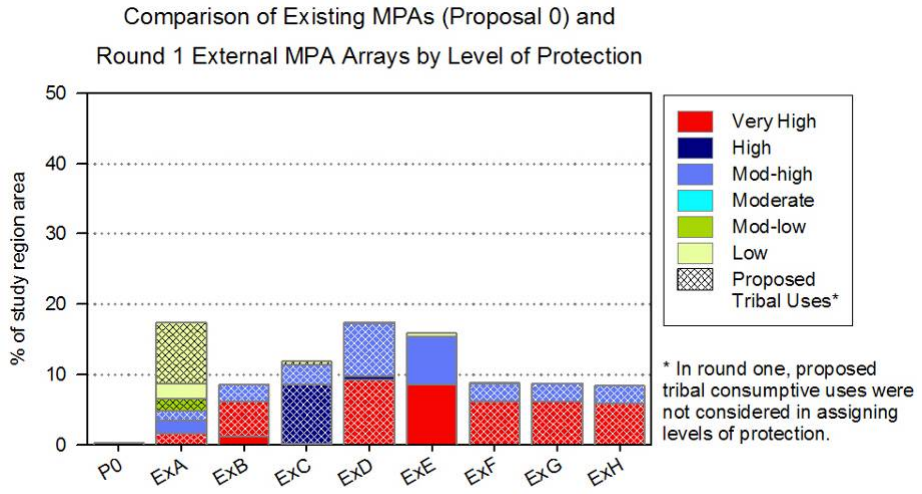
MLPA Goals*: Habitats

1. To protect the natural diversity and function of **marine ecosystems**.
2. To help sustain and restore **marine life populations**.
3. To improve **recreational, educational, and study opportunities** in areas with minimal human disturbance.
4. To protect representative and unique **marine life habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. To ensure that MPAs are designed and managed as **a network**.



** Note that this language represents a summary of the MLPA goals*

Tribal Uses in Round 1 Arrays



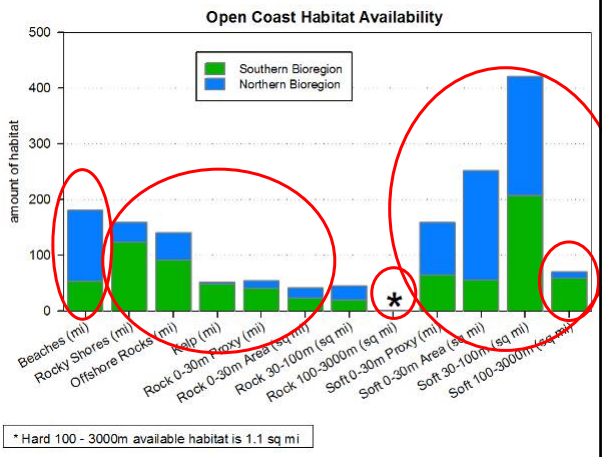
Evaluation: Habitats

Key Questions for Each Draft Array/Proposal

1. How well are key habitat types represented in draft MPA arrays?
2. What are the proposed levels of protection for these habitat types?
3. How well are habitats and levels of protection distributed across the study region?

Habitat Availability and Spacing

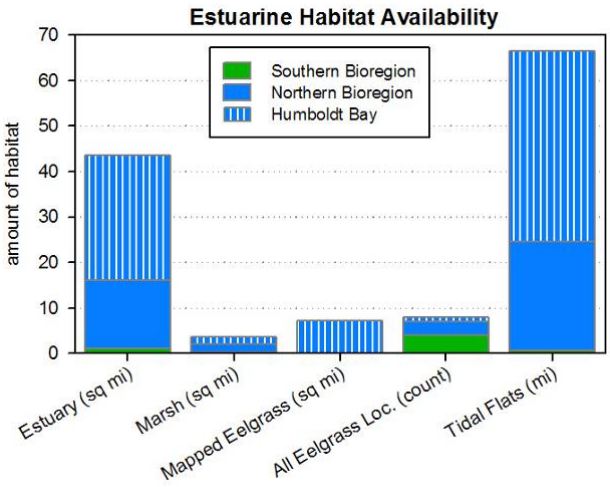
- Nearshore rocky habitats are less abundant in the northern bioregion
- >100 meter depth habitats are rare across the region, occurring mostly in canyons in the southern bioregion
- Soft bottom habitats are especially abundant in the northern bioregion



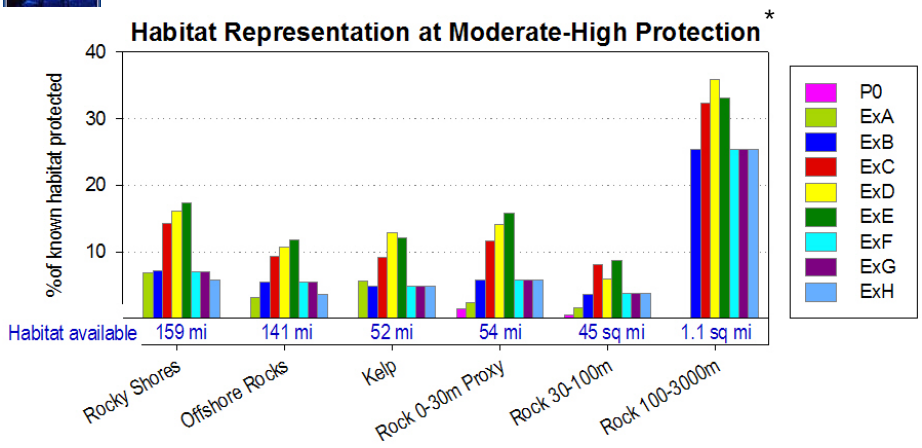
Note: some substrate mapping and 0-30 meter (m) proxy line were not available when external MPA arrays were developed

Results: Habitat Availability

- The northern bioregion contains the majority of estuarine habitats:
  98% of estuarine area
  96% of marsh area
  99% of tidal flats
- Humboldt Bay contains 62% of all estuarine area and 100% of mapped eelgrass in the MLPA North Coast Study Region (NCSR)
- Eelgrass is known to exist in 8 estuaries, 4 in the northern and 4 in the southern bioregions



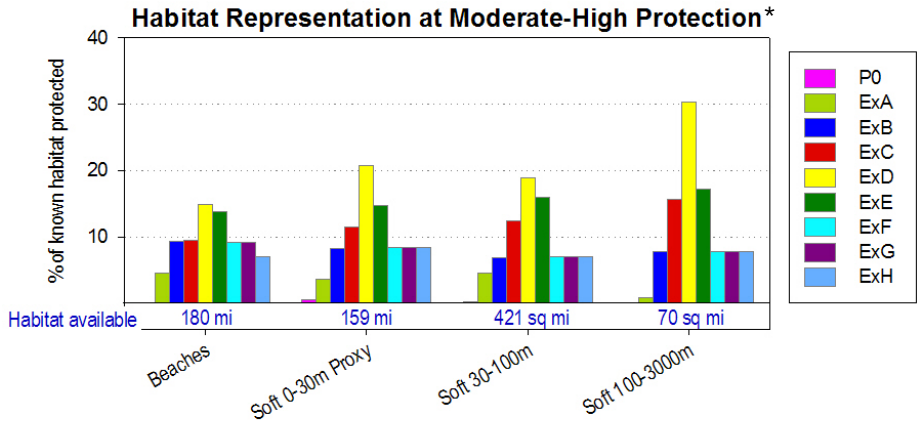
Results: Habitat Representation



- **ExC, ExD and ExE include larger proportion of rocky habitats in MPAs as compared to other arrays**

** Evaluated for all MPAs at or above mod-high protection*

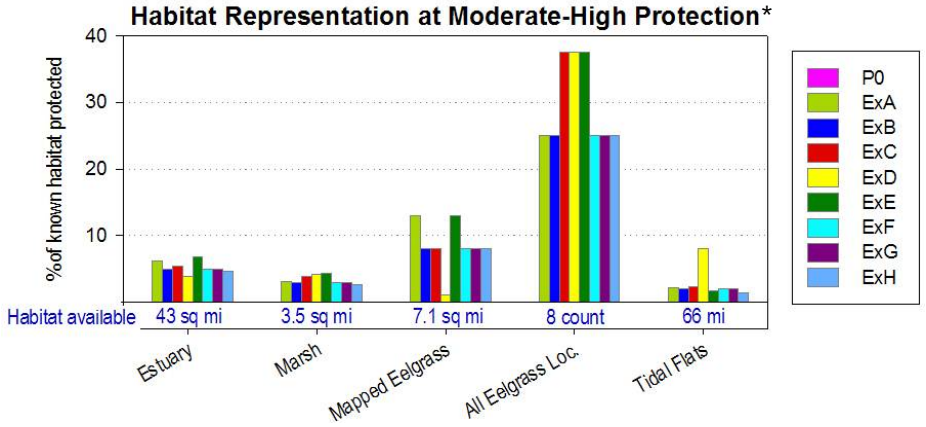
Results: Habitat Representation



- **ExC, ExD, and ExE generally include larger proportion of soft-bottom habitats in MPAs as compared to other arrays**
- **On average, arrays include larger proportion of soft-bottom habitats as compared to rocky habitats**

** Evaluated for all MPAs at or above mod-high protection*

Results: Habitat Representation



- **All arrays include very high protection MPAs in south Humboldt Bay and Ten Mile River estuary**
- **All arrays except ExH include at least one additional estuary in southern bioregion above moderate-high protection (ExC and ExD include two)**

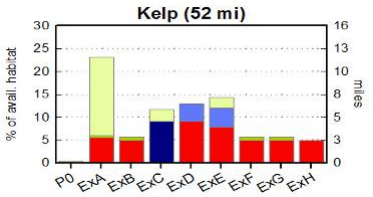
** Evaluated for all MPAs at or above mod-high protection*

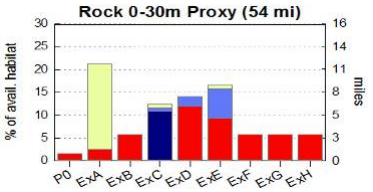
Representation: Rocky Habitats

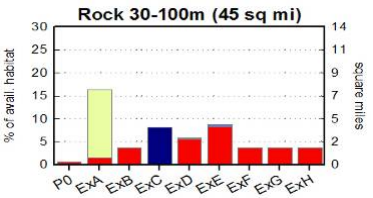
Kelp
- 5-13% of kelp at or above mod-high protection
- ExC, ExD and ExE include largest proportion of kelp at or above mod-high protection

Rock 0-30m
- 2-16% of 0-30m rocky reef at or above mod-high protection
- ExC, ExD and ExE include largest proportion of 0-30m rock at or above mod-high protection

Rock 30-100m
- 2-9% of 30-100m rock at or above mod-high protection
- ExC, ExD and ExE include largest proportion of 30-100m rock at or above mod-high protection







Results: Habitat Representation

Summary

- In general, ExC, ExD and ExE include larger proportion of open coast habitats in MPAs at mod-high protection as compared to other arrays
- Similar configurations in ExB, ExF, ExG and ExH lead to similar habitat representation
- ExA includes large proportion of habitats in low protection MPAs
- Ranking of proposals by average representation at or above mod-high protection across all habitats:

  ExD > ExE > ExC > [ExF & ExG] > [ExB & ExH] > ExA

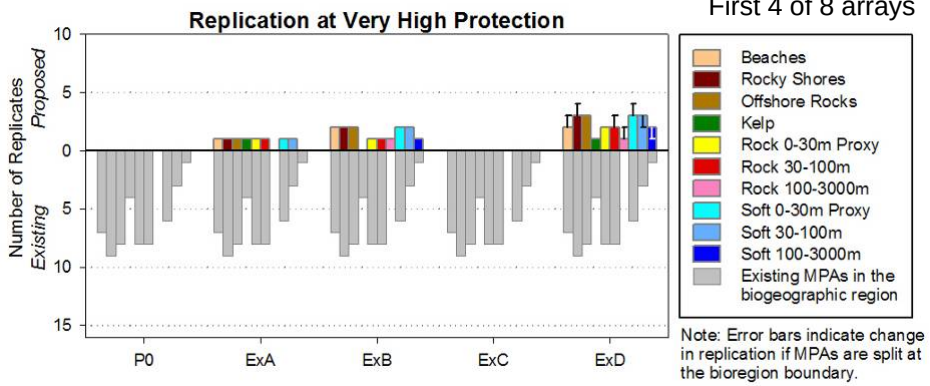
Methods: Habitat Replication

Guidelines for Replication

- 3-5 replicates of habitat per biogeographic region (i.e., from Point Conception to the California-Oregon border)
- SAT recommends at least 1 replicate of each habitat in each of the two north coast bioregions, if possible
- MPA or cluster must meet the minimum size guidelines (9 square miles).
- Habitat must meet the threshold identified to encompass 90% of biodiversity in that habitat type
- Estuarine MPAs do not have to meet size guidelines but must contain at least 0.12 square miles of estuarine habitat

Replication: Very High Protection

First 4 of 8 arrays

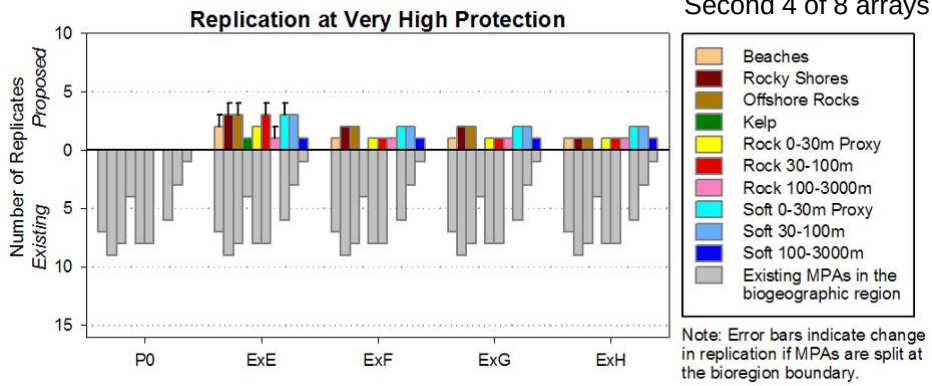


Note: Error bars indicate change in replication if MPAs are split at the bioregion boundary.

- **For most habitats, 3-5 replicates already exist elsewhere in the biogeographic region (north central and central coast regions)**
- **ExA, ExB and ExD include 1-3 replicates of most habitats**
- **In ExD, splitting MPAs at the bioregion boundary would increase replication for some habitats and decrease replication for others**

Replication: Very High Protection

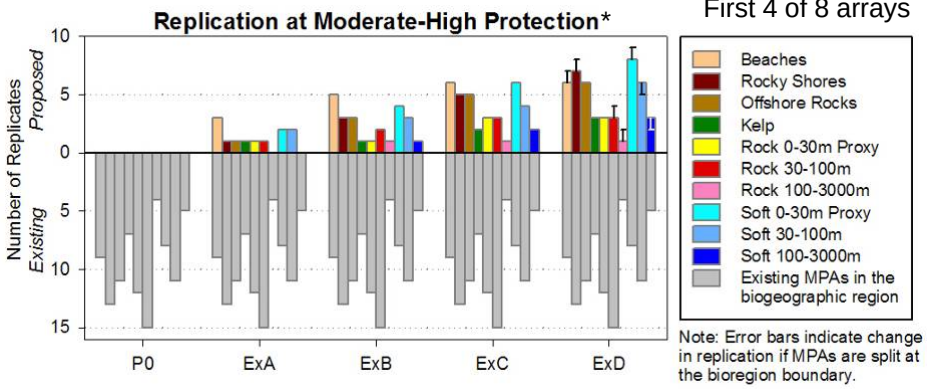
Second 4 of 8 arrays



Note: Error bars indicate change in replication if MPAs are split at the bioregion boundary.

- **For most habitats, 3-5 replicates already exist elsewhere in the biogeographic region (north central and central coast regions)**
- **ExE, ExF, ExG and ExH include 1-3 replicates of most habitats**
- **In ExE, splitting MPAs at the bioregion boundary would increase replication for some habitats**

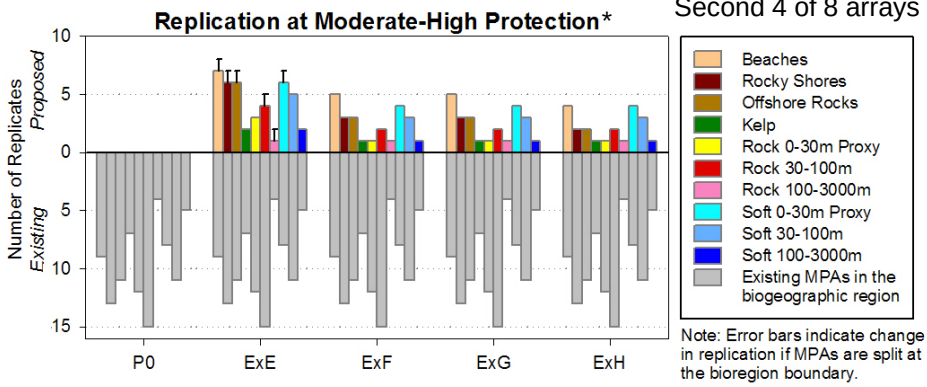
Replication: Mod-High Protection



- **ExC and ExD generally include more habitat replicates than other arrays**

** Evaluated for all MPAs at or above mod-high protection*

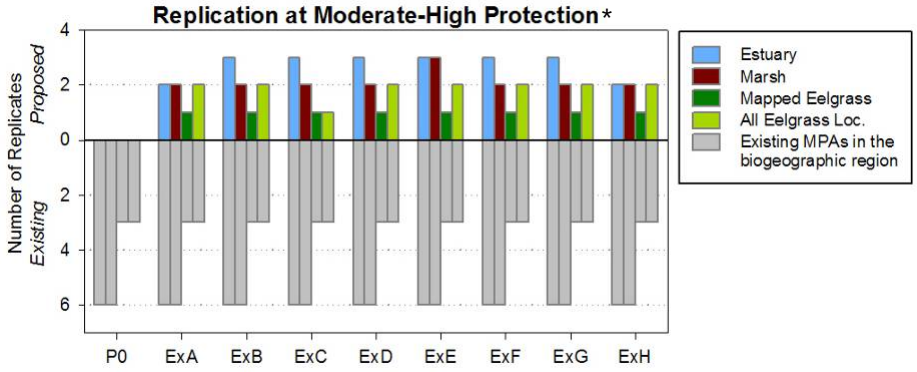
Replication: Mod-High Protection



- **ExE generally includes more habitat replicates than other arrays**

** Evaluated for all MPAs at or above mod-high protection*

Replication: Estuarine Habitats



- **All proposals include 2-3 replicates of estuary habitat**
- **All proposals include 2-3 replicates of coastal marsh**
- **All proposals include 1 replicate of mapped eelgrass in Humboldt Bay**
- **All proposals except ExC include 1 location with eelgrass outside of Humboldt Bay (for a total of 2 eelgrass locations)**

** Evaluated for all MPAs at or above mod-high protection*

Habitat Replication by Bioregion

Rocky Habitats

Number of bioregions with at least 1 habitat replicate

a	Rocky Shores			Offshore Rocks			Kelp			Rock 0-30m Proxy			Rock 30-100m			Rock 100-3000m		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
P0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ExA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
ExB	1	1	2	1	1	2	0	0	1	1	1	1	1	1	2	1	1	1
ExC	0	2	2	0	2	2	0	1	1	0	1	1	0	2	2	0	1	1
ExD	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	1 (2)	1 (2)	1 (2)
ExE	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	1 (2)	1 (2)	1 (2)
ExF	1	1	2	1	1	2	0	0	1	1	1	1	1	1	2	1	1	1
ExG	1	1	2	1	1	2	0	0	1	1	1	1	1	1	2	1	1	1
ExH	1	1	2	1	1	2	0	0	1	1	1	1	1	1	2	1	1	1

Note: Parenthesis () indicate the number of bioregions with replicates if MPAs are split at the bioregion boundary.

- **Only ExD and ExE replicate rocky shores, offshore rocks, and 30-100m rock in both bioregions at very high protection**
- **None of the arrays replicate kelp or 0-30m rock in the northern bioregion**
- **Rock 100-3000m is only available in 1 location, right near the bioregion boundary**

Habitat Replication by Bioregion

Soft Bottom Habitats

Number of bioregions with at least 1 habitat replicate

b	Beaches			Soft 0-30m Proxy			Soft 30-100m			Soft 100-3000m		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
P0	0	0	0	0	0	0	0	0	0	0	0	0
ExA	1	1	2	1	1	2	1	1	2	0	0	0
ExB	1	1	2	1	1	2	1	1	2	1	1	1
ExC	0	2	2	0	2	2	0	2	2	0	1	1
ExD	1 (2)	1 (2)	2	2	2	2	2	2	2	1	1	1
ExE	1 (2)	2	2	2	2	2	2	2	2	1	1	1
ExF	1	1	2	1	1	2	1	1	2	1	1	1
ExG	1	1	2	1	1	2	1	1	2	1	1	1
ExH	1	1	2	1	1	2	1	1	2	1	1	1

Note: Parenthesis () indicate the number of bioregions with replicates if MPAs are split at the bioregion boundary.

- **Only ExD and ExE replicate soft 0-30m and soft 30-100m in both bioregions at very high protection**
- **All arrays replicate beaches, soft 0-30m and soft 30-100m in both bioregions at mod-high protection**
- **None of the arrays replicate soft 100-3000m in the northern bioregion**

Habitat Replication by Bioregion

Estuarine Habitats

Number of bioregions with at least 1 habitat replicate

c	Estuary			Marsh			Mapped Eelgrass*			All Eelgrass Loc.		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
P0	0	0	0	0	0	0	0	0	0	0	0	0
ExA	2	2	2	2	2	2	1	1	1	2	2	2
ExB	2	2	2	2	2	2	1	1	1	2	2	2
ExC	1	2	2	1	2	2	1	1	1	1	1	1
ExD	2	2	2	2	2	2	1	1	1	2	2	2
ExE	2	2	2	2	2	2	1	1	1	2	2	2
ExF	2	2	2	2	2	2	1	1	1	2	2	2
ExG	2	2	2	2	2	2	1	1	1	2	2	2
ExH	2	2	2	2	2	2	1	1	1	2	2	2

* Eelgrass is only mapped in Humboldt Bay and thus mapped eelgrass can only be replicated in the northern bioregion.

- **All arrays except ExC replicate all estuarine habitats across all possible bioregions at very high protection**
- **ExC does not include an eelgrass location in the southern bioregion at or above mod-high protection**

Results: Habitat Replication

Summary

- All habitats already replicated in at least 3-5 MPAs at or above mod-high protection elsewhere in the biogeographic region (north central coast or central coast)
- On average, ExD, ExC and ExE provide largest number of replicates of open coast habitats at or above mod-high protection
- None of the arrays replicate kelp, 0-30m rock, or 100-3000 soft bottom in both bioregions at or above mod-high
- All arrays except ExC replicate all estuarine habitats across all possible bioregions at very high protection
- Ranking of arrays for replication across all habitats at mod-high protection:

  ExD > ExE > ExC > [ExB, ExF & ExG] > ExH > ExA